UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF NEW YORK

RADIANCY, INC.,

Plaintiff and Counter Defendant,

-against-

VIATEK CONSUMER PRODUCTS GROUP, INC.,

Defendant and Counter Claimant.

No. 13-cv-3767 (NSR) (LMS)

OPINION & ORDER

NELSON S. ROMÁN, United States District Judge

By letters dated March 5, 2015 (ECF No. 216) and March 20, 2015 (ECF No. 219), Plaintiff Radiancy, Inc. ("Radiancy") and Defendant Viatek Consumer Products Group, Inc. ("Viatek") requested that the Court accept the documents attached to their letters (ECF Nos. 216-1 and 219-1) as duplicates of the PowerPoint slides that the parties presented during the March 2, 2015 *Markman* hearing. The applications are GRANTED.

The parties had also asked the Court to construe five claim terms in Radiancy's U.S. Patent No. 7,170,034 (the "'034 Patent"). The Court's first claim construction ruling concerned three of the five terms ("juxtaposed," "controller," and "comprises"). *See Radiancy, Inc. v. Viatek Consumer Prods. Grp., Inc. (Radiancy I)*, No. 13-CV-3767 NSR LMS, 2015 WL 221063, at *6 (S.D.N.Y. Jan. 14, 2015). The Court reserved decision on two terms ("pulsed heating of said one or more heat elements" and "such that the heat elements do not burn said skin surface"). *Id.* A *Markman* hearing as to those terms took place on March 2, 2015, and the parties submitted supplemental letter briefs thereafter (*see* ECF Nos. 218, 220). Upon consideration of the parties' initial briefs and opposition papers, arguments at the *Markman* hearing, and supplemental letter

briefs, the Court now issues its claim construction ruling as to the two remaining terms. The background of this case and the law governing claim construction are described in detail in the Court's first claim construction ruling and will not be repeated herein except where necessary. *See Radiancy I*, 2015 WL 221063, at *1-2.

The relevant claims provide (disputed terms in italics):

> 1. A hair cutting apparatus comprising:
> a structure, a portion of which being adapted for placement against a skin surface where hair is to be cut;
> a heat generator comprising one or more heat elements positioned to touch said hair and heated to a temperature sufficient to cut hair, at least one of said heat elements being juxtaposed with said portion; and
> a controller that controls the power source to provide *pulsed heating of said one or more heat elements such that the heat elements do not burn said skin surface*.
> . . . .
> 59. A hair cutting apparatus comprising:
> a structure, a portion of which being adapted for placement against a skin surface where hair is to be cut;
> a heat generator comprising one or more heat elements positioned to touch said hair and heated to a temperature sufficient to cut hair, at least one of said heat elements being juxtaposed with said portion; and
> a controller that controls the power source to provide *pulsed heating of said one or more heat elements*, the controller further comprising a velocity detector.

U.S. Patent No. 7,170,034 at 20:23-32, 24:9-18 (filed July 21, 2002) (emphasis added) [hereinafter '034 Patent]. As an initial matter, Viatek conceded at the *Markman* hearing that the phrase "such that the heat elements do not burn said skin surface," does not require construction. The Court agrees that that phrase is sufficiently unambiguous and nontechnical that construction would be inappropriate. *See also Radiancy I*, 2015 WL 221063, at *6. This leaves only "pulsed heating of said one or more heat elements" for the Court to construe.

I. The Nature of the Dispute Regarding Claim Construction

Viatek proposes the following construction: "periodic heating to a higher desired temperature for a period of time and cooling to a substantially lower temperature for a period of time." Radiancy proposes: "the act of heating said one or more heat elements by pulsed

electricity." The parties appear to agree that pulsed heating has two senses: (1) switching the current passing through a heat element on and off periodically; or (2) continuously electrifying a heat element but periodically removing it from the skin surface. The parties also appear to agree that "pulsed heating" does not encompass devices in which current continuously passes through the heat element and no other mechanism creates pulses. Indeed, the plain language would exclude such devices, and the patent applicants disclaimed such devices during prosecution.[1]

The parties dispute the scope of the first of the senses listed above: what it means to switch the current on and off periodically. Under Viatek's construction, the switching of the current on and off must result in a "substantial[]" temperature change between pulses. This would exclude devices in which the temperature of the heat element remains substantially constant despite the fact that the current is switching on and off. Radiancy's construction is broad enough to encompass such devices.

II. The Claim Language

The claim language grammatically tolerates substantially constant temperature devices. The word "pulsed" modifies "heating," a verbal noun. So what is "pulsed" is the manner in which the heat element is heated—not necessarily the temperature of the heat element or the heat

[1] The Patent and Trademark Office ("PTO") initially rejected the application for the '034 Patent on obviousness grounds because it combined a continuously electrified wire hair remover (patented by a prior art reference *Kneisley*) with a pulsed electrical circuit used to heat a ceramic knife (patented by JP1-2882891). (*See* Handal Decl. Ex. 13, ECF No. 120-3.) In response, the patent applicants amended Claim 1 to add the phrase "such that the heat elements do not burn said skin surface" and explained:

> Claim 1 has been amended to more clearly point out a distinguishing feature of some exemplary embodiments of the present invention. It can be seen from the specification that the pulsing of the heat elements . . . is used to carefully control the temperature of the heat elements. This careful control of the heat element is designed to enable hair cutting but to prevent the burning of the user's skin. Such control is not described, or even suggested, anywhere in [*Kneisley* or JP1-2882891].

(*Id.*) The patent applicants limited their invention to devices in which pulsed heating is employed in order to protect the skin by carefully controlling the temperature. This amounts to a "clear and unmistakable disavowal" of devices in which the heat element is continuously electrified. *Grober v. Mako Prods., Inc.*, 686 F.3d 1335, 1341 (Fed. Cir. 2012).

transferred to the skin and hair. Switching the current on and off repeatedly (i.e., heating the element in a pulsed manner) can result in substantial temperature changes between pulses. But it also can result in immeasurably small temperature changes between pulses, if the pulses are sufficiently wide or the pulse repetition rate is sufficiently high. The only other limitation on pulsed heating in the claim language is that pulsed heating must have the effect of preventing the heat element from burning the skin. The claim language does not specify how to achieve this result. Therefore, the claim language does not contain the requirement of substantial temperature change that Viatek seeks to impose.

III. The Specification

The specification does not define or consistently use the phrase "pulsed heating." In fact, while the claims state that the controller provides "pulsed heating of said one or more heat elements," the specification inconsistently discloses embodiments that provide pulsed heating, pulsed heat, and pulsed current; contrasts these phrases with continuous heating, continuous heat, continuous current, and constant heat; and fails to clearly distinguish the terms. This serves to obfuscate rather than clarify.

The specification is clear, however, that the whole point of the invention is using "periodically applied heat" to cut hair without burning the skin. '034 Patent 1:14-17. The invention accomplishes this by switching the current to the heat element off and on (i.e., pulsing), which allows the heat element to cool in between pulses and limits the amount of heat transferred to the skin over time. The relevant teachings are:

- *Id.* at 2:7-11: "[A] pulsed heat generator provides pulsed heat at the heat elements wherein the pulses of heat are short enough so that although the temperature is high, the amount of heat transferred to the skin does not damage the skin. On the

other hand, hair that contacts the heat element is destroyed, due to the lower heat capacity of the hair."

- *Id.* at 6:34-40: "[T]he heat generator includes an interruptible power supply that energizes said heat element, said controller controls the interruptible power supply to periodically heat said heat generator to a temperature at which it is hot enough to cut hair and then causes it to cool to a lower temperature at which said skin surface is not damaged."
- *Id.* at 7:65-67: "[S]aid pulsation allows the heat element to cool between pulses to an extent that it does not burn the skin while still cutting hair."
- *Id.* at 9:28-42: "In a pulsed embodiment of the invention, the current through wire 100 is pulsed on for between 10 and 100 milliseconds. The length of current pulse, for example, is based upon the peak temperature of wire 100, for example, or other factors such as the speed at which wire 100 passes over skin 104. During this short period of time, wire 100 heats to the desired temperature. However, in the short time that the current is on, the amount of heat generated is not sufficient to heat skin 104 to a temperature at which it is damaged. Because the heat dissipates in skin 104 faster than in a hair, wire 100 does not have sufficient time to damage skin 104, but cuts hair 102. Generally, wire 100 moves in a direction 108 along a portion of skin 104 and if the movement is halted, absent the pulsing of the heat, wire 100 will burn skin 104."
- *Id.* at 11:34-48: "Power from power supply 310 causes heat element 324 to heat to a temperature that is sufficient to cut hair, for example, between 700-800° C when contact with a hair is between 10 and 50 milliseconds. An optional pulsar

> 320 (which can be part of power supply 310) regulates the current produced by power supply 310 so that it, for example, produces pulsed heat for a period of 10-200 milliseconds such as 50 ms. The time between pulses is regulated, depending on the rest of the construction, to allow heat element 324 to cool sufficiently and to be off for a sufficient period to avoid burning of the skin and build-up of heat, even if heat element 324 is not moved. Generally, the pulse rate is between 1 and 100 Hz. However, as described below, if mechanical motion is provided to heat element 324 so that it does not continuously contact the skin, high duty cycles and even continuous heating may be provided."

Thus the specification teaches that switching the current off changes the temperature of the heat element. But Viatek's construction goes too far by requiring that temperature change to be "substantial." When current passing through a heat element is switched off, the heat element will necessarily drop in temperature because it is constantly losing heat to the air. True, that drop may be a fraction of a degree given the heat element's capacity to retain heat, the ambient temperature, and how quickly the current is switched back on. If the pulse width is sufficiently large, or the pulse repetition rate is sufficiently high, the temperature change between pulses (though present) can be immeasurably small. Provided that the current is switched on and off periodically, there is no basis to impose the additional requirement that the resultant temperature change meet a factfinder's estimation of "substantial."[2]

[2] In the Court's reading of the '034 Patent, the claims even disclose pulse width and rate combinations that would result in substantially constant temperature by any reasonable measure of the word "substantial." Claim 2 discloses pulse widths between 10 and 100 milliseconds, and claim 3 discloses pulse repetition rates between 1 and 100 Hertz (100 Hertz represents 100 on-off cycles per second). A combination of, for example, a pulse width of 99 milliseconds and rate of 100 Hertz would result in a 1-milisecond "off" period per on-off cycle. It is hard to believe that the heat element could drop to a "substantially" cooler temperature in 1 millisecond under any reasonable jury's understanding of the word "substantial." But since expert testimony has not been submitted on these issues, the Court does not base its ruling on this observation, but rather the other justifications expressed in this Opinion.

IV. The Prosecution History

The prosecution history is consistent with this result. There is no contradictory "clear and unmistakable" disavowal. The patent applicants disavowed devices in which the heat element is constantly *electrified* (and no other mechanism generates pulses). *See supra* note 1. But nothing amounts to a disavowal of devices in which the heat elements maintain a substantially constant *temperature*.

V. The Court's Construction

Although the Court agrees with Radiancy that there is no basis to impose a limitation of substantial temperature change, Radiancy's proposed construction ("the act of heating said one or more heat elements by pulsed electricity") is unsatisfactory for other reasons. First, it does not sufficiently distinguish between pulsed electricity and alternating current ("AC"). AC, even when continuously applied, can be misconstrued as "pulsed electricity" in some sense because AC alternates in a sinusoid between a positive and a negative voltage. (*See* Yang Decl. ¶¶ 19-24, ECF No. 145.) But the patent applicants disclaimed devices in which current (AC or DC) is continuously applied to the heat elements, *see supra* note 1, and the specification speaks in terms of switching the current on and off (not varying the voltage periodically), *see supra* pp.4-6. Therefore, it is clear that continuously applied AC is not "pulsed heating" within the meaning of the '034 Patent. (*See also id.* ¶ 20 ("AC line electricity is distinctly different from pulsed electricity. . . . One of the clearest differences between AC line electricity and pulsed electricity is that the waveform of AC line electricity is a continuous sinusoidal, while the waveform of pulsed electricity contains a series of discrete hi/low pulses.").) AC can be used to generate "pulsed heating" within the meaning of the '034 Patent if, for example, some circuit element switches the AC power on and off periodically. But the Court declines to construe "pulsed heating" in a way that arguably encompasses continuously applied AC. Second, Radiancy's

proposed construction excludes disclosed embodiments in which the heat elements are continuously electrified and pulsed heating is generated by other (e.g., mechanical) means. *See* '034 Patent 12:65-13:50, 22:47-63, figs.6-8. Figures 6 through 8, for example, disclose an embodiment in which the heat elements are continuously heated (i.e., continuously electrified) but are periodically removed from the skin to prevent skin damage. *Id.* As the heat elements in this embodiment are not "heat[ed] . . . by pulsed electricity," the embodiment would fall outside of Radiancy's proposed construction. "[A] claim interpretation that does not cover a disclosed embodiment is rarely, if ever, correct." *High Tech Med. Instrumentation, Inc. v. New Image Indus., Inc.*, 135 F.3d 774 (Fed. Cir. 1997) (unpublished) (internal quotation marks omitted). Third, Radiancy's proposed construction uses both of the words that the parties seek to have construed ("the act of *heating* by *pulsed* electricity"), which risks impermissibly delegating the construction function to the jury. *Markman v. Westview Instruments, Inc.*, 517 U.S. 370, 387 (1996) ("Questions of construction are questions of law for the judge, not questions of fact for the jury." (quoting A. Walker, Patent Laws § 75, p. 68 (3d ed. 1895))).

For the foregoing reasons, the Court construes "pulsed heating of said one or more heat elements" to mean "(1) periodic switching on and off of current to said one or more heat elements or (2) generation of pulses of heat by other means (e.g., by mechanical means)."

Dated: June 1st, 2015
White Plains, New York

SO ORDERED:

NELSON S. ROMÁN
United States District Judge